

Chapter 7.0 Conclusion

7.1 Findings and Significance of Study

This dissertation is mainly on the issues surrounding the implementation of IPv6 in the x-kernel. The new IPv6 protocol module is still in its infancy stage and at the moment it is still not yet implemented in a global scale. However there are few networks or backbones around the world which have implemented either a full or partial IPv6 implementation.

For the issues of implementing IPv6 in the x-kernel simulator, this dissertation rounds up four main issues, which are:

- (i) The x-kernel implementation environment and in-depth study of the x-kernel architecture.
- (ii) The IPv6 specification and the x-kernel architecture that can be used to implement IPv6.
- (iii) The proposed remodeled IPv6 protocol module source code and the existing IPv4 implementation that can be manipulated to implement IPv6.
- (iv) The simulation environment that the x-kernel provides and the simulation configuration for the proposed IPv6 module.

These issues were based on a minimal specification for an Ethernet based connection in a network of two hosts with the IPv6 module plugged in. The implementation issues are purportedly to be focused on the x-sim, to show that if the proposed module were successful, then the x-sim would be able to work as expected. Furthermore, the proposed module only addresses the new IPv6 address architecture. The issues that were not taken

into account for the proposed IPv6 module includes fragmentation, routing and header options.

Based on the research done, it can be concluded that the x-kernel has the potential of implementing IPv6 and is capable of simulating this new protocol. This dissertation basically shows that the x-kernel can be used not only to implement new protocols, but it also has the capability of using the existing protocols available within itself for research purposes. As for the source code of IPv6 protocol, this dissertation only points at the IP layer modified from the IPv4 protocol.

The main purpose of looking at issues regarding a minimal IPv6 in the x-kernel is to have a thorough understanding of IPv6 in the x-kernel and x-sim.

7.2 Limitations

With the limited resources available on the x-kernel, the issues discussed here are focused at only main points, rather than a full scope of the real implementation. The real simulation is not yet implemented, as it takes much more research work and expertise in the area of networking technologies in the operating system with the capability to hard-code a network protocol from scratch. These factors, limit this dissertation from the real implementation of the IPv6 protocol into the x-kernel.

7.3 Future work

The basic implementation issues of the IPv6 gives way to further studies and experimentation on this protocol. Besides this, the routing and fragmentation properties can be introduced and further enhanced. This dissertation also provides partial working source code which can be used in the development of a full source code.

Other experiments such as implementing the IPv6 module in the x-kernel as a stand-alone mode, where the real implementation is tested over a real internetwork can be done for future work. These options suggest some of the intriguing and exciting possibilities of IPv6 implementation in the x-kernel.